

CLAIMS

1. A matte powder coating composition comprising a powder coating (A) comprising a resin, a curing agent and a colorant, and a powder coating (B) comprising a resin and a curing agent without containing a colorant, wherein the powder coating (B) has a gelation time of 1200 seconds or less, and the difference in the gelation time of the powder coating (B) and the powder coating (A) is 400 seconds or more.  
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- 10 2. The matte powder coating composition according to claim 1, wherein the powder coating (B) comprises at least one member selected from the group consisting of a  $\beta$ -hydroxyalkyl amide compound, a blocked isocyanate and a melamine compound as a curing agent.
- 15 3. The matte powder coating composition according to claim 1, wherein the powder coating (B) comprises a polyester or acrylic resin having a hydroxyl group as a resin, and a blocked isocyanate which is blocked with at least one blocking agent selected from the group consisting of methyl isobutyl ketone oxime, methyl ethyl ketone oxime, 1,2-pyrazole, 3,5-dimethylpyrazole, 1H-20 1,2,4-triazole, 1H-1,2,3-triazole, 1H-1,2,4-triazole-3-thiol and 1H-1,2,3-triazolo[4,5-b]pyridine as a curing agent.  
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4. The matte powder coating composition according to claim 1, wherein the powder coating (B) comprises a resin having a hydroxyl group or a resin having an epoxy group as a resin, and a compound having a carboxyl group and a

blocked isocyanate as a curing agent.

5. The matte powder coating composition according to claim 4, wherein the powder coating (B) comprises a polyester as the resin having a hydroxyl group and an acrylic resin as the resin having an epoxy group.

6. The matte powder coating composition according to claim 4 or 5, wherein the compound having a carboxyl group comprises dodecanedicarboxylic acid and/or an acrylic resin having an acid value of 200 mg KOH/g or more.

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7. The matte powder coating composition according to claim 5 or 6, wherein the acrylic resin having an epoxy group has a weight-average molecular weight of from 5,000 to 100,000 and an epoxy equivalence of from 250 to 600 g/mol.

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8. The matte powder coating composition according to any one of claims 5 to 7, wherein the acrylic acid having an epoxy group has a hexane tolerance of from 3.0 to 8.5.

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9. The matte powder coating composition according to any one of claims 4 to 8, wherein the blocked isocyanate comprises a blocked isocyanate which is blocked by  $\epsilon$ -caprolactam.

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10. The matte powder coating composition according to claim 9, wherein the blocked isocyanate which is blocked by  $\epsilon$ -caprolactam is contained in an amount of 20% by weight or more of the total amount of the blocked isocyanate.

11. The matte powder coating composition according to any one of claims 4 to 10, wherein the blocked isocyanate is contained in an amount of from 15 to 60 parts by weight based on 100 parts by weight of a total amount of the resin having a hydroxyl group, the resin having an epoxy group and the compound having a carboxyl group.

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10 12. The matte powder coating composition according to any one of claims 1 to 11, wherein the powder coating (A) comprises two or more kinds of color powder coatings having different hues.

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10 13. The matte powder coating composition according to claim 12, wherein each of the differences in lightness of the two or more color powder coatings having different hues are within 30.

14. The matte powder coating composition according to any one of claims 1 to 13, wherein the powder coating (B) is contained in an amount of 30% by weight or less of the powder coating composition.

20 15. The matte powder coating composition according to any one of claims 1 to 14, wherein the powder coating (B) has an average particle size of 25  $\mu\text{m}$  or less, and the difference in particle sizes of the powder coating (B) and the powder coating (A) is within  $\pm 15\%$  the average particle size of the powder coating (B).

16. The matte powder coating composition according to any one of claims 1 to 15, wherein the powder coating (B) has a standard deviation of the particle size of 20  $\mu\text{m}$  or less.

5 17. A process for preparing a matte powder coating composition comprising the step of mixing a powder coating (A) comprising a resin, a curing agent and a colorant, and a powder coating (B) comprising a resin and a curing agent without containing a colorant, wherein the powder coating (B) has a gelation time of 1200 seconds or less, and the difference in the gelation time of the powder 10 coating (B) and the powder coating (A) is 400 seconds or more.

15 18. The process according to claim 17, wherein the powder coating (B) comprises at least one member selected from the group consisting of a  $\beta$ -hydroxyalkyl amide compound, a blocked isocyanate and a melamine compound as a curing agent.

20 19. The process according to claim 17, wherein the powder coating (B) comprises at least one member selected from the group consisting of a polyester or acrylic resin having a hydroxyl group as a resin, and a blocked isocyanate which is blocked with at least one blocking agent selected from the group consisting of methyl isobutyl ketone oxime, methyl ethyl ketone oxime, 1,2-pyrazole, 3,5-dimethylpyrazole, 1H-1,2,4-triazole, 1H-1,2,3-triazole, 1H-1,2,4-triazole-3-thiol and 1H-1,2,3-triazolo[4,5-b]pyridine as a curing agent.

25 20. The process according to claim 17, wherein the powder coating (B)

comprises a resin having a hydroxyl group or a resin having an epoxy group as a resin, and a compound having a carboxyl group and a blocked isocyanate as a curing agent.

5        21. The process according to claim 20, wherein the powder coating (B) comprises a polyester as the resin having a hydroxyl group and an acrylic resin as the resin having an epoxy group.

10        22. The process according to claim 20 or 21, wherein the compound having a carboxyl group comprises dodecanedicarboxylic acid and/or an acrylic resin having an acid value of 200 mg KOH/g or more.

15        23. The process according to claim 21 or 22, wherein the acrylic resin having an epoxy group has a weight-average molecular weight of from 5,000 to 100,000 and an epoxy equivalence of from 250 to 600 g/mol.

20        24. The process according to any one of claims 21 to 23, wherein the acrylic acid having an epoxy group has a hexane tolerance of from 3.0 to 8.5.

25        25. The process according to any one of claims 20 to 24, wherein the blocked isocyanate comprises a blocked isocyanate which is blocked by  $\epsilon$ -caprolactam.

25        26. The process according to claim 25, wherein the blocked isocyanate which is blocked by  $\epsilon$ -caprolactam is contained in an amount of 20% by weight or more of the total amount of the blocked isocyanate.

27. The process according to any one of claims 20 to 26, wherein the blocked isocyanate is contained in an amount of from 15 to 60 parts by weight based on 100 parts by weight of a total amount of the resin having a hydroxyl group, the resin having an epoxy group and the compound having a carboxyl group.

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28. The process according to any one of claims 17 to 27, wherein the powder coating (A) comprises two or more kinds of color powder coatings having different hues.

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29. The process according to claim 28, wherein each of the differences in lightness of the two or more color powder coatings having different hues are within 30.

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30. The process according to any one of claims 17 to 29, wherein the powder coating (B) is contained in an amount of 30% by weight or less of the powder coating composition.

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31. The process according to any one of claims 17 to 30, wherein the powder coating (B) has an average particle size of 25  $\mu\text{m}$  or less, and the difference in particle sizes of the powder coating (B) with the powder coating (A) is within  $\pm 15\%$  the average particle size of the powder coating (B).

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32. The matte powder coating composition according to any one of claims 17 to 31, wherein the powder coating (B) has a standard deviation of the particle

size of 20  $\mu\text{m}$  or less.

33. A method for forming a matte coating film characterized by applying the matte powder coating composition as defined in any one of claims 1 to 16.